

## **RESEARCH PROBLEM STATEMENT #DC-603**

### **I – Problem Title**

Effects of Transportation Corridor Features On Driver and Pedestrian Behavior and on Community Vitality

### **II – Research Problem Statement**

This study will review, quantify and analyze domestic and international published literature, research in progress, current studies and practices regarding the impact and measurement of transportation corridor design features on traveler safety and economic vitality along transportation corridors. This study will support the implementation of Context Sensitive Solutions through planning, design, and measurement of the cost/benefit of design features requested by local stakeholders.

The study will provide quantification and analysis of how design factors [including various placement, configurations, and interrelationships of the following features]:

- a) Contribute to traffic calming and other safety-related changes in driver and pedestrian behavior, and
- b) Add economic value to communities and the environment adjacent to access-controlled freeways, expressways, arterials, and ‘main street’ highways.
  - Trees
  - Other plantings
  - Bicycling facilities
  - Pedestrian facilities [including sidewalks, bulb-outs and refuges]
  - Street furniture
  - Signage for community identity.
  - Paving [including lane widths, transitions, colors and materials]
  - Parking
  - Vehicle traffic calming features
  - Speed-transition zones
- c) Affect safety, utilizing accident data and the associated economic factors.

The study will identify where economic benefit is conveyed, whether back to the transportation agency, to the community, or to the environment at the local, regional, and statewide levels.

The study will include consultation with national committees, transportation agencies, and other relevant organizations on the state of knowledge and practice. It will indicate gaps and needs in documentation where further research may be undertaken, so that performance measures can be made defensible and meaningful for decision-makers.

### **III – Objective**

The primary objective of this study is to gain information that will facilitate more defensible measurement by transportation agencies of the effects that design features contribute to quality of life (i.e., safety and economic vitality).

### **IV – Background**

Nationally, departments of transportation are increasing their use of performance measures to assess multimodal transportation systems. Guidance is limited on assessing whether goals are being achieved cost effectively or are generating net benefits, and how those benefits are being distributed.

Design features for which outcomes and benefits cannot be measured are becoming increasingly difficult to justify and prioritize in times of limited funding. Those factors that support quality-of-life and more livable communities have been particularly hard to quantify and measure. A need exists to assess performance, sufficient to adequately inform decision-makers.

### **V – Estimate of Duration of Research**

Three-year duration.

### **VI -Statement of Urgency, Benefits, and Expected Return on Investment**

This study is urgently needed. Local partners expect and demand more context sensitive transportation systems. Without defensible measures of the effects of corridor design features, departments of transportation will miss opportunities to be responsive to their partners. The cost of the study is minimal compared to the potential positive safety and economic effects of transportation improvements to communities and the environment at the local, regional, and statewide levels.

### **VII – Related Research**

ARCC Spring Research Conference April 200, “*Transportation + Street Trees: Effect of the Urban Design Industry’s Roadside Landscape Improvement Standards on Driver and Pedestrian Performance*”, Jody Rosenblatt Naderi, Assistant Professor, Texas A&M University Department of Landscape Architecture and Urban Planning, [jnaderi@archone.tamu.edu](mailto:jnaderi@archone.tamu.edu)

Institute of Urban & Regional Development, University of California, Berkeley, Abstract WP-652, “*Multiple Roadway Boulevards: Case Studies, Designs, and Design Guidelines*”, November 1995, Allan Jacobs, Elizabeth MacDonald, Yodan Rofo

Journal of the American Planning Association, Summer 2005, “*Safe Streets, Livable Streets*”, Eric Dumbaugh, School of Civil and Environmental Engineering, Georgia Institute of Technology

Universitat Wurzburg 2004, “*Influence of Road Side Vegetation on Driver Behavior and Traffic Safety on Rural Roads*”, Professor Dr. Hans-Peter Kruger, [Krueger@psychologies.uni-wuerzburg.de](mailto:Krueger@psychologies.uni-wuerzburg.de)

[www.coloradotrees.org/benefits.htm](http://www.coloradotrees.org/benefits.htm) “*Benefits of Trees in Urban Areas, Urban Tree Benefits References*”, Kathleen Alexander

Minnesota Department of Transportation, Minnesota Local Road Research Board, “*Investigating the Effects of Traffic Calming Strategies on Driver Behavior*”, Final Report January 2002, Kathleen A. Harder, Ph.D. Program for Interdisciplinary Human Factors Research in Simulation and Transportation, Department of Mechanical Engineering, University of Minnesota and John C. Carmody, M.Arch.Center for Sustainable Building Research, College of Architecture and Landscape Architecture, University of Minnesota

### **VIII - Deployment Potential**

This research has probable potential to lead to additional in-depth examination of these issues. The probable deployable product is a change in performance measures, policies, manuals or capital project priorities for access-controlled freeways, expressways and arterials, and ‘main street’ highways.

Caltrans’ stakeholders include the Divisions of Design.